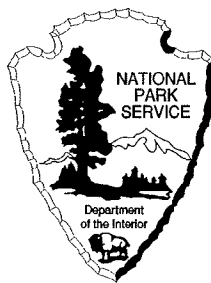


CLEAN WATER ACT  
WATER QUALITY DESIGNATED USES AND  
IMPAIRMENTS  
  
for  
  
BENT'S OLD FORT NATIONAL HISTORIC SITE

Technical Report NPS/NRWRD/NRTR-2003/302

March 2003

National Park Service  
Water Resources Division  
Fort Collins, Colorado



TO THE WATER WORKS  
OF THE CITY OF NEW YORK  
AND  
THE BOARD OF WATER SUPPLY

FOR THE PURPOSE OF  
OBTAINING THE  
RIGHTS OF THE CITY OF NEW YORK

IN THE MATTER OF THE  
WATER WORKS OF THE CITY OF NEW YORK  
AND THE BOARD OF WATER SUPPLY

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## EXECUTIVE SUMMARY

Director's Order NPS-75 requires the National Park Service (NPS) Natural Resource Inventory and Monitoring Program to establish a Servicewide inventory of waterbodies and water quality use classifications. The Government Performance and Results Act of 1993 (GPRA) directs Federal agencies to articulate program goals in a quantifiable and measurable manner. These mandates are reflected in the mission goals of the 2000 NPS Strategic Plan. Included among these mission goals are the creation of a water resources inventory and achieving a target of 85% of 265 park units with unimpaired waterbodies. To help achieve the goals of NPS-75, GPRA, and the NPS Strategic Plan, this report summarizes for Bent's Old Fort National Historic Site (BEOL): (1) Clean Water Act (CWA) State-designated uses; (2) CWA 303(d) quality impaired waters and causes; (3) special designations recognizing waters of exceptional quality as defined in State water quality standards; and (4) hydrographic statistics based on the United States Geological Survey (USGS) 1:100,000 scale National Hydrography Dataset (NHD). Data sources used to compile this report include: Environmental Protection Agency (EPA) Total Maximum Daily Load (TMDL) Tracking System, EPA Water Quality Standards Database, EPA National Assessment Database, EPA EnviroMapper for Water, USGS NHD, and the Colorado Department of Public Health and Environment – Water Quality Control Division.

Based on the NHD, a total of 2.28 miles of perennial streams are within or adjacent to the BEOL park boundary. No lakes, ponds, or reservoirs were identified within or adjacent to the BEOL park boundary in the NHD. State-designated uses for classified waterbodies within or adjacent to the BEOL park boundary include: (1) agriculture; (2) aquatic life warm water - class 2; (3) domestic water source; and (4) recreation primary contact. The State of Colorado designated the Arkansas River on its 2002 303(d) list as quality impaired for aquatic life warm water – class 2 and domestic water source. Based on the NHD, 2.28 miles of the impaired Arkansas River are located within the BEOL park boundary, accounting for 100% of total park stream miles. The pollutant responsible for the impairment of the Arkansas River is identified in as iron. The pollutant sources are listed as “natural” and “agriculture” in the 2002 Colorado 305(b) report. A TMDL was completed for fecal coliform for the Arkansas River in 1998. No Outstanding National Resource Waters or Outstanding State Resource Water designations have been applied to waters within or adjacent to the BEOL park boundary.





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## INTRODUCTION

The National Park Service's (NPS) Organic Act of 1916 and the Clean Water Act (CWA) are two important pieces of federal legislation that provide for the preservation, conservation, and protection of water resources within units of the National Park System. The mission of the Organic Act states that "the Service thus established shall promote and regulate the use of Federal areas known as national parks, monuments and reservations . . . by such means and measures as conform to the fundamental purpose of the said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (16 U.S.C. Section 1). The stated objective of the CWA is to "restore and maintain the chemical, physical and biological integrity of the nation's waters" (33 U.S.C. Section 1251(a)).

To help meet its resource stewardship responsibilities the NPS established the Natural Resource Inventory and Monitoring (I&M) Program. The goal of the I&M Program is to acquire the information and expertise needed by park managers to maintain ecosystem integrity in the approximately 270 National Park System units that contain significant natural resources (National Park Service 2000a). The establishment of a Servicewide natural resource inventory, which is to include a water resources inventory, is an important objective of the I&M Program. The 1992 Director's Order NPS-75, *Natural Resources and Inventory Monitoring Guideline*, recommends the water resources inventory include: (1) location (with additional classification from that included in digital cartographic information) of streams, lakes, wetlands, and groundwater (hot springs, cold springs); and (2) water quality use classifications (Ibid, 26).

The Government Performance and Results Act of 1993 (GPRA) directs Federal agencies to articulate program goals in a quantifiable and measurable manner. GPRA requires the use of strategic plans, annual performance plans, and annual performance reports for Federal programs (Galvin 1999). The 2000 NPS Strategic Plan reflects the mandates of NPS-75 and GPRA in its mission goals. Included in these goals are the creation of a water resources inventory (mission goal Ib1) and achieving a target of 85% of 265 park units with unimpaired waters (mission goal Ia4) (National Park Service 2000b, 17, 20).

### Purposes

The purposes of this report are to compile and summarize the following for Bent's Old Fort National Historic Site (BEOL): (1) CWA State-designated use classifications; (2) CWA 303(d) quality impaired waters and causes; (3) special designations recognizing waters of exceptional quality as defined in State water quality standards; and (4) hydrographic statistics based on the United States Geological Survey (USGS) 1:100,000 scale National Hydrography Dataset (NHD). This report provides the water quality use classifications for park waterbodies as directed by NPS-75 and the I&M Strategic Plan (National Park Service 1993). Although hydrographic statistics are presented in the report, it is important to note that these were generated from the 1:100,000-scale (medium resolution) NHD, which is complete for the entire country. It is anticipated that the I&M Program will acquire 1:24,000-scale (high resolution) NHD for parks to provide the definitive locations and inventory of streams, lakes, rivers, and other hydrographic features. This effort, however, will likely take several years.

### Bent's Old Fort National Historic Site Environs and Overview

BEOL is located in southeast Colorado in the Upper Arkansas – Lake Meredith subbasin<sup>1</sup> (Figure 1). Based on the NHD, a total of 2.28 miles of perennial streams are within or adjacent to the BEOL park boundary. No lakes, ponds, or reservoirs were identified within or adjacent to the BEOL park boundary in the NHD (Table I). State-designated uses for classified waterbodies within or adjacent to the BEOL park boundary include: (1) agriculture; (2) aquatic life warm water - class 2; (3) domestic water source; and (4) recreation primary contact (Table II and Figure 2). Use support designations are provided in Table III. The State of Colorado designated the Arkansas River on its 2002 303(d) list as quality impaired for aquatic life warm water – class 2 and domestic water source. Based on the NHD, 2.28 miles of the impaired Arkansas River are located within the BEOL park boundary, accounting for 100% of total park stream miles. The pollutant responsible for the impairment of the Arkansas River is identified as iron. The pollutant sources are listed as "natural" and "agriculture" in the 2002 Colorado 305(b) report (Table IV). A TMDL

<sup>1</sup> A subbasin is equivalent to the USGS cataloging unit identified by an 8-digit hydrologic unit code.

was completed for fecal coliform for the Arkansas River in 1998 (Table V). No Outstanding National Resource Waters (ONRWs) or Outstanding State Resource Water designations have been applied to waters within or adjacent to the BEOL park boundary.

## **BACKGROUND**

### **Water Quality Standards**

An important component of the CWA is the requirement of water quality standards. Water quality standards are established by the States and consist of three elements: (1) designated use classifications; (2) numerical and/or narrative water quality criteria; and (3) an antidegradation policy (Environmental Protection Agency 1998, 5). The CWA requires all States to establish use classifications for all waterbodies within the State, *e.g.*, public drinking water supplies, propagation of fish and wildlife, recreational purposes, industrial, and other uses. Water quality criteria are numerical descriptions of the physical, chemical, and biological characteristics of waters necessary to support the designated uses (Gallagher and Miller 1996, 58).

### **Federal Antidegradation Policies and Regulations**

The antidegradation policy as promulgated by the Environmental Protection Agency (EPA) in the Code of Federal Regulations at 40 C.F.R. Part 131.12 acts as a key portion of States' water quality standards by requiring, at a minimum, States to include provisions for the management of water quality in accordance with the following 'Tiers':

Tier 1: Includes the provisions to protect existing uses of water in the State, which constitute the absolute floor or minimum level of protection that must be provided all waters (Environmental Protection Agency 1993, 4-1).

Tier 2: Applies to waters whose quality exceeds that necessary to protect "fishable/swimmable" goals of the CWA. Management of these waters must attempt to keep them at existing quality. Degradation may be allowed if it cannot be avoided for social or economic development reasons, but only after public review has occurred (Ibid).

Tier 3: Applies to Outstanding National Resource Waters where ordinary use classifications and supporting criteria may not be sufficient or appropriate. ONRWs are frequently considered the highest quality waters of the United States, but may also include waterbodies that are of "exceptional recreational or ecological significance," as stated under 40 C.F.R. Section 131.12(a)(3) of the antidegradation policy. ONRWs are afforded the highest level of protection under the antidegradation policy. Existing water quality is to be maintained and protected, and only activities that cause short-term and temporary degradation may be allowed (Environmental Protection Agency 1993, 4-10).

An additional concept of a Tier 2 ½ waterbody was developed by States out of a concern that the Tier 3 provision was too restrictive of social and economic development. A Tier 2 ½ waterbody, which the EPA does accept, offers more protection than a Tier 2 waterbody without the strict prohibition against the lowering of water quality found in the Tier 3 provision (Ibid, 4-2).

The National Park System encompasses some of the most sensitive, pristine, and significant aquatic resources in the United States. Many of these aquatic resources have been afforded the protection of Tier 2 ½ or Tier 3 ONRW status. Such exceptional waterbodies located within or adjacent to park boundaries shall be identified in this report.

### **Colorado State Antidegradation Regulations**

Colorado's water quality standards and regulations are codified in Regulation No. 31 of the Colorado Code of Regulations (C.C.R.) at Title 5 C.C.R. 1002-31 (Basic Standards and Methodologies for Surface Water). The antidegradation provisions of Regulation No. 31 are summarized below as quoted from the 1998 Colorado Water Quality Management and Drinking Water Protection Handbook:

The antidegradation provisions of the Basic Standards and Methodologies for Surface Water: (1) set forth provisions regarding the adoption of water quality-based designations for certain surface

waters; and (2) establish an antidegradation review process applicable to certain activities impacting the quality of surface waters. See generally, section 31.8.

Either of two water quality-based designations may be adopted in appropriate circumstances. Section 31.8(2). An "outstanding waters" designation may be applied to certain high quality waters that constitute an outstanding natural resource. No degradation of outstanding waters by regulated activities is allowed. A "use-protected waters" designation may be applied to waters with existing quality that is not better than necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water. The quality of these waters may be altered so long as applicable use-based water quality classifications and standards are met.

Waters that are not given one of these designations are subject to antidegradation review requirements before any new or increased water quality impacts are allowed. Section 31.8(3). The activities that are subject to these requirements are those that: (1) require a discharge permit; (2) require water quality certification under section 401 of the federal Act; or (3) are subject to control regulations. The first step in the antidegradation review process is a determination, in accordance with criteria specified in the regulation, whether "significant degradation" would result from the activity. If not, the review ceases. If significant degradation would result, a determination is made whether the degradation is necessary to accommodate important economic or social development in the area in which the waters are located. This determination is based on an assessment of whether there are quality control alternatives available that would result in less degradation of state waters and which are economically, environmentally, and technologically reasonable. The proposed degradation is allowed only if no such alternatives are available (Ibid, 34).

### **303(d) Waterbodies and Total Maximum Daily Loads**

Waterbodies that fail to comply with standards are compiled by States into a list, commonly referred to as "303(d) lists" after the section of the CWA which contains the requirement, for submittal to the EPA. The EPA approves the list only if it meets applicable requirements. Waterbodies on an approved 303(d) list require the establishment of a total maximum daily load (TMDL) (Environmental Protection Agency 2002a). A TMDL specifies the amount of a particular pollutant that may be present in a waterbody, allocates allowable pollutant loads among sources, and provides the basis for attaining or maintaining water quality standards (65 Fed. Reg. 43588 (July 13, 2000)). For the purposes of this report, a 303(d) listed waterbody is considered impaired.

### **Waterbodies (Waters of the United States)**

The term "waterbodies" is used in this report with the same meaning the EPA applies to the term "navigable waters." "Navigable waters" are defined in the CWA to include all "waters of the United States." The term "waters of the United States" is defined in Title 40 C.F.R. Part 122.2 as:

(a) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; (b) All interstate waters, including interstate "wetlands;" (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters: (1) Which are or could be used by interstate or foreign travelers for recreational or other purposes; (2) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or (3) Which are used or could be used for industrial purposes by industries in interstate commerce; (d) All impoundments of waters otherwise defined as waters of the United States under this definition; (e) Tributaries of waters identified in paragraphs (a) through (d) of this definition; (f) The territorial sea; and (g) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a) through (f) of this definition.

Although not included in the above referenced definition, the EPA has also ruled that springs and seeps that support unusual flora or fauna which attract large numbers of out-of-state scientists are considered "waters of the United States" (Sullivan 1995, 139). Anthropogenic waste treatment systems, such as treatment ponds or lagoons, are not included as "waters of the United States."

### **Waterbody Identifications and Reaches**

Water quality standard information in this report is linked to State-defined waterbody identification (WBID) codes. A WBID is a unique code, which represents the basic unit for reporting water quality standards to the EPA. States currently use a variety of methods for defining WBIDs, such as the use of individual monitoring stations and Natural Resource Conservation Service watersheds. The geographic extents for these WBIDs are occasionally defined by States using geographic information systems (GIS) but more often are only described textually (Environmental Protection Agency 2001, Appendix B).

A reach is a continuous, unbroken stretch or expanse of surface water. In the NHD, this idea has been expanded to define a reach as a significant segment of surface water that has similar hydrologic characteristics, such as a stretch of stream/river between two confluences, or a lake/pond (U.S. Geological Survey 2000a, 9). The EPA has strongly encouraged States to uniformly adopt the NHD reach addressing protocol for assigning WBIDs (Environmental Protection Agency 2001, Appendix B).

The geographic representation of water features in the NHD serves as a framework for organizing and integrating water quality attribute information under the EPA WATERS<sup>2</sup> system. Since relatively few States have adopted the NHD reach addressing protocol, the EPA is currently undergoing the process of georeferencing State WBIDs and other water quality program information to reaches in the NHD (Environmental Protection Agency 2002b). In other words, the EPA is assigning reach codes to State WBIDs so that they may be analyzed and displayed by computer-based tools, such as a GIS.

A recent study prepared by the General Accounting Office (GAO) noted the difficulties the EPA faces when transferring State water quality data to the NHD in the WATERS system due to the number of different ways States define their waters. According to the GAO study, less than one-third of State water quality officials who were interviewed indicated that their States' water quality is reflected "somewhat" or "very" accurately in the WATERS system (General Accounting Office 2002, 28). Errors noted by the NPS during the preparation of this and similar reports included incomplete georeferencing and misidentifications of WBIDs. Although reasonable efforts were made to find and correct any errors originating from EPA georeferencing efforts, the NPS makes no expressed or implied guarantees regarding the depiction of WBIDs in this report.

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<sup>2</sup> WATERS (Watershed Assessment, Tracking & Environmental Results) unites water quality information that was previously available only from several independent and unconnected databases (*e.g.*, TMDL Tracking System and the Water Quality Standards Database). WATERS is located on the Internet at <http://www.epa.gov/waters/>.

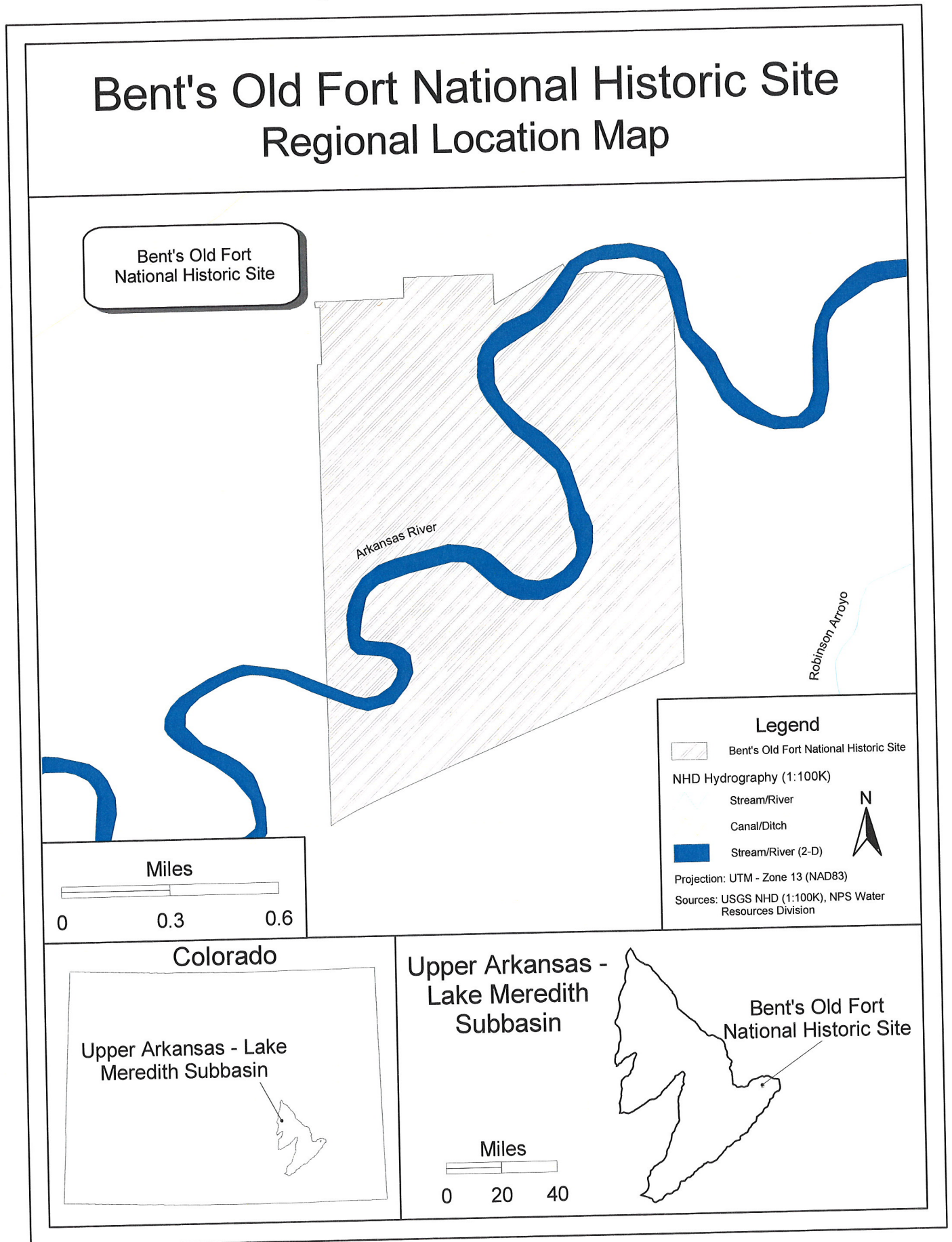
## DATA SOURCES

Information used to compile this report was derived primarily from the following sources:

- **Water Quality Standards Database (WQSDB)** – The WQSDB is being developed by the EPA for the purpose of tracking water quality standards, including designated uses and numeric criteria, for the Nation's surface waters. The source information for the WQSDB is obtained from each State's water quality standards (WQS) regulations. For those States not currently included in the WQSDB, the full text of the WQS is made available on EPA's WQSDB website. The WQSDB can be visited at: <http://www.epa.gov/wqsdatabase>. For more information on the WQSDB, contact Bill Kramer at [kramer.bill@epa.gov](mailto:kramer.bill@epa.gov), (202) 260-5824, or at the following mailing address: 1200 Pennsylvania Avenue NW, Mailcode 4305T, Washington, DC 20460.
- **National Assessment Database (NAD)** – NAD contains information on the attainment of water quality standards. Assessed waters are classified as either Fully Supporting, Threatened, or Not Supporting their designated uses. This information is reported in the National Water Quality Inventory Report to Congress under Section 305(b) of the Clean Water Act. NAD can be visited at: <http://www.epa.gov/waters/305b>. For more information on NAD, contact Cary McElhinney at [mcelhinney.cary@epa.gov](mailto:mcelhinney.cary@epa.gov), (202) 566-1188, or at the following mailing address: 1200 Pennsylvania Avenue NW, Mailcode 4503T, Washington, DC 20460.
- **TMDL Tracking System** – The EPA TMDL Tracking System contains information on all impaired waters under section 303(d) of the CWA. The database also has information on EPA approved TMDLs. The TMDL Tracking System can be visited at: <http://www.epa.gov/waters/tmdl/trcksys.html>. For more information on the TMDL Tracking System, contact Chris Laabs at [laabs.chris@epa.gov](mailto:laabs.chris@epa.gov), (202) 260-7030, or at the following mailing address: 1200 Pennsylvania Avenue NW, Mailcode 4503T, Washington, DC 20460.
- **EnviroMapper for Water** – EnviroMapper for Water is a web-based Geographic Information System application that dynamically displays information about bodies of water in the U.S. This interactive tool allows the creation of customized maps portraying the nation's surface waters along with a collection of environmental data. EnviroMapper can be visited at: <http://www.epa.gov/waters/enviromapper>. For more information on EnviroMapper, contact Cary McElhinney at [mcelhinney.cary@epa.gov](mailto:mcelhinney.cary@epa.gov), (202) 566-1188, or at the following mailing address: 1200 Pennsylvania Avenue NW, Mailcode 4503T, Washington, DC 20460.
- **National Hydrography Dataset (NHD)** – The USGS NHD is a nationally consistent hydrography database for the United States. It combines elements of the USGS digital line graph (DLG) hydrography files and the EPA Reach File (RF3). The NHD contains unique reach identifiers, called reach codes, for each reach in the coverage. In addition to linear hydrography, the NHD contains points and areal (or polygonal) entities to represent features such as wells, springs, lakes, and reservoirs. The NHD with a 1:100,000 scale (medium resolution data) was used for this report. High resolution data (typically developed from 1:24,000 scale USGS topographic maps) are currently under development and are not available on a wide enough basis to be utilized for this project. The NHD can be visited at: <http://nhd.usgs.gov>. For more information on the NHD, contact Paul Wiese at [pmwiese@usgs.gov](mailto:pmwiese@usgs.gov), (303) 202-4298, or at the following mailing address: P.O. Box 25046, MS 516, Denver, CO 80225-0046.
- **Colorado Department of Public Health and Environment – Water Quality Control Division (Colorado WQCD)** – The Colorado WQCD was contacted for further information on waterbody designated uses and impairments, as well as information on Outstanding National and State Resource Waters. The WQCD website can be accessed at: <http://www.cpdhe.state.co.us/wq/wqhom.asp>. For more information, contact Sarah Johnson at [sarah.johnson@state.co.us](mailto:sarah.johnson@state.co.us), (303) 692-3500, or at the following mailing address: 4300 Cherry Creek Drive South, Denver, CO 80246-1530.



Figure 1. Regional Location Map





## PARK HYDROGRAPHIC STATISTICS

Table I summarizes statistics for areal, linear, and point hydrographic features within and adjacent to the BEOL park boundary based on the USGS 1:100,000 scale NHD. Prior to running any statistical analyses on the BEOL hydrography, the NHD and BEOL park boundary shapefile were projected into the Universal Transverse Mercator (UTM) zone 15, North American Datum (NAD) 83 coordinate system. A subset of the NHD, consisting only of waterbodies found within or adjacent to the BEOL park boundary, was generated using the ArcView Geoprocessing Wizard. The lengths and areas of the “clipped” dataset were finally calculated using the “Add Acres/Miles” option of the AlaskaPak ArcView extension.

The determination of what constituted an adjacent waterbody was a judgment call based on a review of the NHD, the park boundary shapefile, and 1:24,000 scale USGS topographical maps. In general, any waterbody that appeared to be contiguous with the park boundary was considered to be adjacent.

**Table I. Park Hydrographic Statistics**

AREAL HYDROGRAPHIC FEATURES (Based on the NHD Waterbody Theme)					
Feature Description	Hydrographic Category	Acres	% of Total	Shoreline Miles	% of Total
Stream/River (2-dimensional) <sup>1</sup>	Perennial	65.45	100	0	--
Total		65.45		0	
LINEAR HYDROGRAPHIC FEATURES By Feature Description (Based on the NHD Network Element Theme)					
Feature Description/Hydrographic Category		Miles	% of Total		
Stream/River – Perennial <sup>2</sup>		2.28	100		
Total <sup>3</sup>		2.28			
By Level (Based on the NHD Transport and Coastline Reach Theme)					
Level <sup>4</sup>		Miles	% of Total		
2		2.28	100		
Total <sup>3</sup>		2.28			
POINT HYDROGRAPHIC FEATURES (Based on the NHD Point Landmark Theme)					
Feature Description		Count	% of Total		
No point hydrographic features within BEOL		0	--		
Total		0			

**Notes:**

<sup>1</sup>In the NHD stream/river are depicted as 1-dimensional lines or 2-dimensional waterbodies. A 2-dimensional waterbody in the NHD is a hydrographic feature that is delineated using areas (U.S. Geological Survey 2000a, 39).

<sup>2</sup>For the purpose of generating linear hydrographic statistics, the “Stream/River – Perennial” category incorporates the NHD feature type “artificial path” for those artificial paths located within a perennial 2-dimensional stream/river. An artificial path represents the flow of water into, through, and out of features delineated using areas (that is, it serves as a centerline) and also delineates the coastline (U.S. Geological Survey 2000a, 8).

<sup>3</sup>Totals for linear hydrographic features may differ slightly due to rounding errors.

<sup>4</sup>Level – Stream level. Has a value range of 1 to 99 and the value –9998 for “unspecified” (U.S. Geological Survey 2000b, 9). Stream level is assigned by identifying the terminus of the drainage network. The lowest value for stream level is assigned to a transport reach at the end of a flow and to upstream transport reaches that trace the main path of flow back to the head. The stream level is incremented by one and is assigned to all transport reaches that terminate at this path (that is, all tributaries to the path) and to all transport reaches that trace the main path of the flow along each tributary back to its head. The stream level value is incremented again and is assigned to transport reaches that trace the main path of the tributaries to their heads. This process is continued until all transport reaches for which flow is encoded are assigned a stream level (U.S. Geological Survey 2000a, 18).

## DESIGNATED USES

Colorado waterbodies are classified according to the uses for which they are presently suitable or intended to become suitable. Classifications may be established for any of Colorado's waterbodies, except that water in ditches and other manmade conveyance structures shall not be classified (5 C.C.R 1002-31, 39). State-designated beneficial use definitions for the waterbodies within or adjacent to the BEOL park boundary are provided in Table II. State-designated beneficial uses and use support information for waterbodies within or adjacent to the BEOL park boundary are listed in Table III<sup>3</sup>. Waterbody designated uses and impairment status are shown in Figure 2.

The State-designated uses and hydrographic statistics located in Table III are based on GIS WBID shapefiles provided for the NPS Water Resources Division by the EPA. State-designated use data provided by the State was used in lieu of the EPA data if the State data was more up-to-date or there was a discrepancy between the EPA and State data. Best professional judgment was used to edit the EPA provided WBID shapefiles if the shapefiles did not appear to correspond with the State's description of the WBID.

**Table II. State-Designated Beneficial Use Definitions**

State - Designated Use Code	State-Designated Use	State-Designated Use Definition
AG	Agriculture	These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.
ALWW2	Aquatic Life Warm Water-Class 2	These are waters that are not capable of sustaining a wide variety of warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.
DWS	Domestic Water Source	These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent) these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.
RPC	Recreation Primary Contact	These surface waters are suitable or intended to become suitable for recreational activities in or on the water when the ingestion of small quantities of water is likely to occur. Such waters include but are not limited to those used for swimming, rafting, kayaking and water-skiing.

Source: EPA WQSDb (Version 3).

<sup>3</sup> Park hydrographic statistics in Table III account only for those NHD hydrographic features with an assigned WBID. Not all NHD features (e.g., canal/ditch) are waterbodies as defined above in the background section. Therefore, Table III hydrographic statistics may differ from Table I.

**Table III. State-Designated Beneficial Uses and Use Support Information**

Segment Name/Description <sup>2</sup>	WBID (305b WBID) <sup>3</sup>	Miles (In Park)	Miles (Adjacent)	Shoreline Miles <sup>4</sup>	Acres (In Park)	Acres (Adjacent) <sup>5</sup>	State-Designated Uses and Use Support <sup>1</sup>			
							AG	ALWW2	DWS	RPC
Mainstem of the Arkansas River from the Colorado Canal headgate to the inlet to John Martin Reservoir.	COARLA01B (COARLA01B_3700)	2.28					F	NS	NS	F

*Sources:* State of Colorado, Colorado Department of Public Health and Environment – Water Quality Control Division. 2002a. *Status of Water Quality in Colorado*; and *Regulation No. 32 – Classifications and Numeric Standards for Arkansas River Basin* (5 C.C.R. 1002-32).

**Notes:**

<sup>1</sup> Use Support Codes: F = Full support, T = Threatened, P = Partial support, N = Not supported, NA = Not assessed for use support. Shaded rows have a use support designation of P or N.

<sup>2</sup> Segment Description was taken from Colorado water quality regulations.

<sup>3</sup> Some States use a different WBID for waters defined in their 305b reports than for waters defined in their water quality standards. Depending on the State, the geographic extent of the 305b WBID (as compared to the water quality standard WBID) can be the same, can be a subset of, or can cover multiple WBIDs.

<sup>4</sup> Shoreline Miles applies to adjacent lakes/ponds, seas/oceans, swamps/marshes, reservoirs, or estuaries.

<sup>5</sup> Acres (Adjacent) applies only to the NHD 2-dimensional streams/rivers, which are represented in the NHD waterbody theme with polygons.

## WATER QUALITY CRITERIA

Water quality criteria for waterbodies within Colorado can be found in the Colorado Department of Public Health and Environment – Water Quality Control Division – Regulation No. 31 – *The Standards and Methodologies for Surface Water* located on the Internet at <http://www.cdphe.state.co.us/op/regs/waterregs/100231.pdf>. Criteria specific to those WBIDs within or adjacent to BEOL can be found in the Colorado Department of Public Health and Environment – Water Quality Control Division – Regulation No. 32 – *Classification and Numeric Standards for Arkansas River Basin* located on the Internet at <http://www.cdphe.state.co.us/op/regs/waterregs/1002361201.pdf>.

## IMPAIRED WATERBODIES

Waterbodies with a use support designation of partial support or not supported are considered impaired for the purposes of CWA 303(d) listing. The Arkansas River was the only 303(d) listed waterbody within or adjacent to the BEOL park boundary, accounting for 100% of total park stream mileage (based on the 1:100,000 scale NHD). Impairment information for the Arkansas River is summarized below in Table IV.

**Table IV. Summary of Park Impaired Waterbodies**

<b>Waterbody Name</b>	Arkansas River
<b>303d WBID</b>	COARLA01B
<b>Impaired Miles of WBID Within/Adjacent to Park</b>	2.28
<b>Total Impaired Miles of WBID</b>	101
<b>Total Miles of WBID</b>	101
<b>Impaired Use(s)</b>	Aquatic Life Warm Water-Class 2 and Domestic Water Source
<b>Pollutant(s)<sup>1</sup></b>	Fe
<b>Potential Source(s)</b>	Natural, Agriculture
<b>TMDL Development Priority</b>	Low
<b>Cycle<sup>2</sup></b>	2002

Sources: State of Colorado. Colorado Department of Public Health and Environment – Water Quality Control Division. 2002a. *Status of Water Quality in Colorado*; and Id., 2002b. *Water Quality Limited Segments Still Requiring TMDLs – Colorado's 2002 303(d) List and Monitoring and Evaluation List*.

**Notes:**

<sup>1</sup>The Colorado 2002 305(b) report also lists selenium and sulfate as pollutants causing impairment; however, selenium and sulfate were delisted prior to the release of the 2002 303(d) list due to a change in standards.

<sup>2</sup>The year associated with the 303(d) list or assessment.

## TOTAL MAXIMUM DAILY LOAD

The TMDL program of the Clean Water Act provides the framework for identifying and restoring impaired waterbodies. This program requires TMDLs for all 303(d) listed waterbodies. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources (Environmental Protection Agency 2002a). Information on approved TMDLs for waterbodies within or adjacent to BEOL are summarized below in Table V.

**Table V. Summary of Approved TMDLs**

<b>WBID</b>	<b>TMDL ID</b>	<b>Pollutant</b>	<b>Cycle<sup>1</sup></b>	<b>TMDL Establishment Date</b>
COARLA01 <sup>2</sup>	760	Fecal Coliform	1996	1/6/1998

Source: EPA TMDL Tracking System.

**Notes:**

<sup>1</sup>The year associated with the list or assessment.

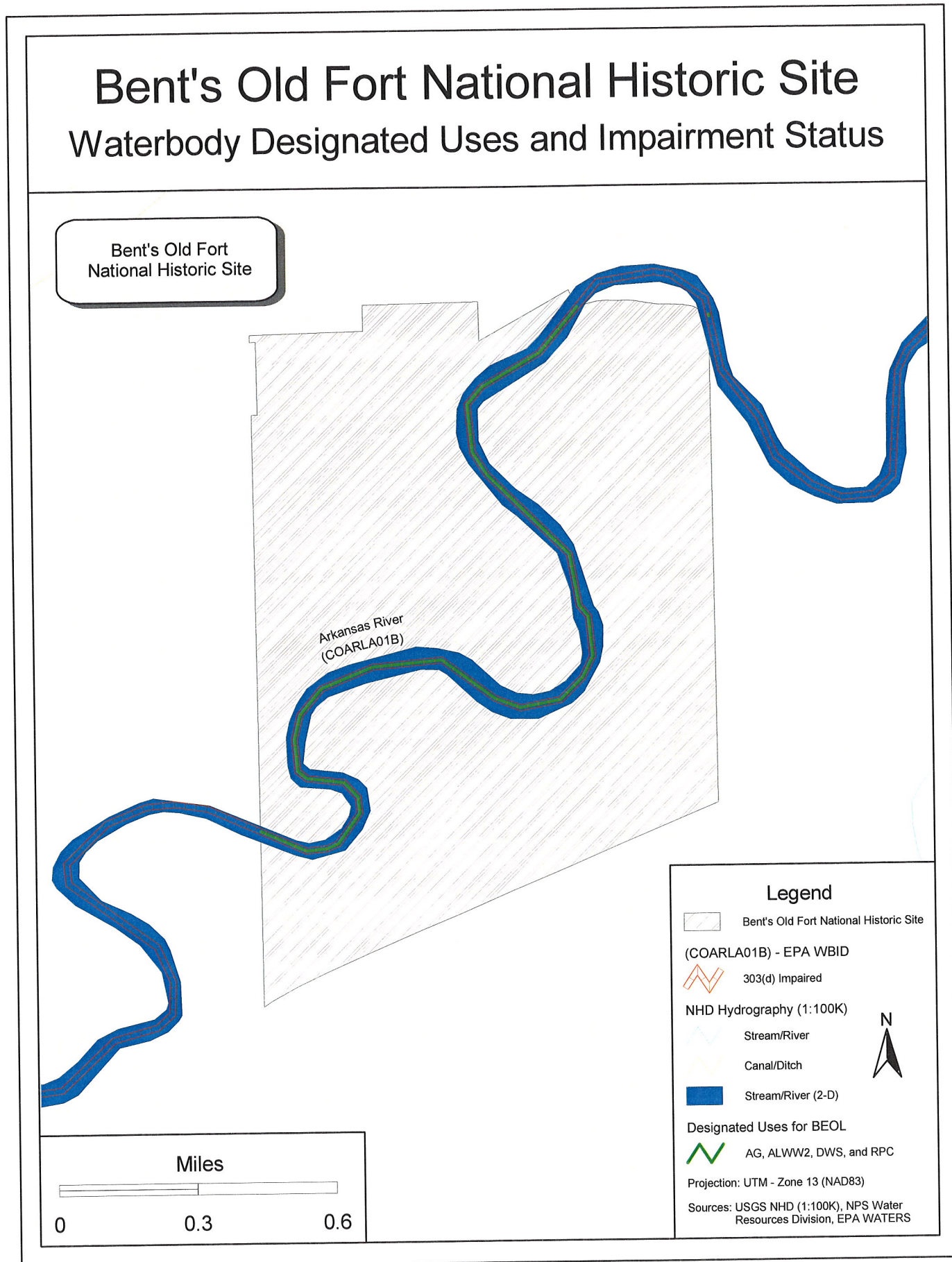
<sup>2</sup>COARLA01 is inclusive of COARLA01B.

## **OUTSTANDING NATIONAL AND STATE RESOURCE WATERS**

No ONRW (Tier 3) or Outstanding State Resource Waters (Tier 2 ½) have been applied to waters within or adjacent to the BEOL park boundary (5 C.C.R. 1002-32).



Figure 2. Waterbody Designated Uses and Impairment Status



## LITERATURE CITED

- "Antidegradation Policy." *Code of Federal Regulations* Title 40, Pt. 131.12, 2001 ed. Available from <http://www.access.gpo.gov/nara/cfr/cfr-table-search.html#page1>.
- "The Basic Standards and Methodologies for Surface Water." *Colorado Code of Regulations* Title 5, Regulation 1002-31 (30 October 2001). Available from <http://www.cdphe.state.co.us/op/regs/waterregs/100231.pdf>.
- "Classifications and Numeric Standards for Arkansas River Basin." *Colorado Code of Regulations* Title 5, Regulation 1002-32 (20 January 2003). Available from <http://www.cdphe.state.co.us/op/regs/waterregs/100232tablearkansasbasin.pdf>.
- "Congressional Declaration of Goals and Policy." *U.S. Code* Title 33, Section 1251(a). Quoted in Thomas F.P. Sullivan (ed.). 1995. *Environmental Law Handbook (13th ed.)*. 136. Rockville: Government Institutes, Inc.
- Environmental Protection Agency. 1993. *Water Quality Standards Handbook – Second Edition* (Ch. 4 – Antidegradation). Washington, DC: Office of Water Regulations and Standards.
- \_\_\_\_\_. 1998. *Water Quality Criteria and Standards Plan – Priorities for the Future*. EPA 822-R-98-003. Available from <http://www.epa.gov/waterscience/standards/criplan615.pdf>.
- \_\_\_\_\_. 2001. *2002 Integrated Water Quality Monitoring and Assessment Report Guidance*. Available from <http://www.epa.gov/owow/tmdl/2002wqma.pdf>.
- \_\_\_\_\_. 2002a. *Introduction to TMDLs*. Available from <http://www.epa.gov/owow/tmdl/intro.html>.
- \_\_\_\_\_. 2002b. *Geography of Waters*. Available from <http://www.epa.gov/waters/about/geography.html>.
- "EPA Administered permit programs: The national pollutant discharge elimination system – Definitions." *Code of Federal Regulations* Title 40, Pt. 122.2, 2001 ed. Available from <http://www.access.gpo.gov/nara/cfr/cfr-table-search.html#page1>.
- Gallagher, Lynn. M., and Leonard. A. Miller. 1996. *Clean Water Handbook (2nd ed.)*. Rockville: Government Institutes, Inc.
- Galvin, Denis P. 1999. *Statement of Denis P. Galvin, Deputy Director, National Park Service, Department of the Interior, Before the Subcommittee on National Parks, Historic Preservation, and Recreation of the Senate Committee on Energy and Natural Resources, concerning the implementation of the Government Performance and Results Act*. Available from <http://www.nps.gov/legal/testimony/106th/gpra8499.htm>.
- General Accounting Office. 2002. *Water Quality: Inconsistent State Approaches Complicate Nation's Efforts to Identify Its Most Polluted Waters*. GAO-02-186 Water Quality. Available from <http://www.epa.gov/waters/doc/gaofeb02.pdf>.
- National Park Service. 1992. *Natural Resources Inventory Monitoring Guideline*. Publication NPS-75. Available from <http://www.nature.nps.gov/nps75/nps75.pdf>.
- \_\_\_\_\_. 1993. *Strategic Plan for Conducting Level I Baseline Natural Resource Inventories in the National Park Service*.
- \_\_\_\_\_. 2000a. *Natural Resource Inventory & Monitoring in National Parks*. Available from <http://www.nature.nps.gov/im/brochure/imbroch.htm>.
- \_\_\_\_\_. 2000b. *NPS Strategic Plan for FY 2001-2005*. Available from [http://planning.den.nps.gov/document/NPS\\_strategic\\_plan.pdf](http://planning.den.nps.gov/document/NPS_strategic_plan.pdf).

"The National Park Service Organic Act."\* *U.S.Code* Title 16, Section 1, 2000 ed. Available from <http://www.access.gpo.gov/uscode/uscmmain.html>. \* This title is not an official short title but merely a popular name used for the convenience of the reader.

"Revisions to the Water Quality Planning and Management Regulation and Revisions to the National Pollutant Discharge Elimination System Program in Support of Revisions to the Water Quality Planning and Management Regulation; Final Rule." *Federal Register* 65:135 (13 July 2000) p. 43588. Available from <http://www.epa.gov/owow/tmdl/finalrule/finalrule.pdf>.

State of Colorado. Colorado Department of Public Health and Environment – Water Quality Control Division. 1998. *Colorado Water Quality Management and Drinking Water Protection Handbook – A Continuing Planning Process*. Commission Policy #98-2. Expiration Date: December 31, 2002. Available from <http://www.cdphe.state.co.us/op/wqcc/98-2.pdf>.

\_\_\_\_\_. 2002a. *Status of Water Quality in Colorado*.

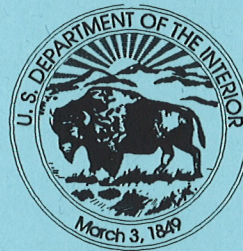
\_\_\_\_\_. 2002b. *Water Quality Limited Segments Still Requiring TMDLs – Colorado's 2002 303(d) List and Monitoring and Evaluation List*. Available from <http://www.cdphe.state.co.us/op/wqcc/combo303dfinal.pdf>.

Sullivan, Thomas F. P., ed. 1995. *Environmental Law Handbook (13th ed.)*, 139. Rockville: Government Institutes, Inc.

U.S. Geological Survey. 2000a. *Concepts and Contents: NHD Technical Reference*. Available from [http://nhd.usgs.gov/chapter1/chp1\\_data\\_users\\_guide.pdf](http://nhd.usgs.gov/chapter1/chp1_data_users_guide.pdf).

\_\_\_\_\_. 2000b. *Introducing the NHDinARC*. Available from [http://nhd.usgs.gov/chapter2/IntroNHDinARC02\\_07.pdf](http://nhd.usgs.gov/chapter2/IntroNHDinARC02_07.pdf).





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As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people. The Department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.